

WHAT IS CLAIMED IS:

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A method comprising:
in response to user action on a canvas, selecting at least one area of a first image which relates to an area on a distortion grid;
using a plurality of points local to the at least one area to calculate a distortion local to the area;
extracting at least one component of the distortion;
applying the at least one component a second area of the first image.

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2. The method of claim 1 wherein the at least one component of the distortion is one of displacement, rotation, magnification, skew and directional scaling.

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3. The method of claim 2 wherein the extracting comprises calculating an affine transform from the plurality of points.

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4. The method of claim 3 wherein the extracting further comprises decomposing the affine transform into a translation and a linear transform matrix.

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5. The method of claim 3, wherein the extraction of magnification comprises calculating the determinant of the linear transform matrix.

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6. The method of claim 3, wherein the extraction of rotation comprises calculating an angle from the elements of the linear transform matrix.

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7. The method of claim 3, wherein the extraction of scaling comprises calculating a pair of eigenvalues of the linear transform matrix, and wherein each eigenvalue represents the amount of scaling in a direction represented by a corresponding projection matrix.

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8. The method of claim 7 wherein a rotation is removed from the linear transform matrix prior to calculating the pair of eigenvalues.

9. The method of claim 7 wherein a skew is removed from the linear transform matrix prior to calculating the pair of eigenvalues.

10. The method of claim 1 wherein a user selects the at least one component.

11. The method of claim 10 wherein the user selects the at least one component from a menu displayed on a user interface.

12. The method of claim 1 wherein a user selects the area for the applying by the location of a virtual brush.

13. The method of claim 1 wherein the applying is to an entire image.

14. The method of claim 1 wherein the applying is to a second image.

15. The method of claim 14 wherein the second image is different from the first image.

16. A computer program product, disposed in a computer readable medium, having instructions to cause a computer to:

using a plurality of points surrounding a first area of an image related to an area in a distortion grid, calculate at least one component of a distortion at the first area;
apply the at least one component of the distortion to a second area of the image.

17. The computer program product of claim 16 wherein the at least one component of the distortion is one of displacement, rotation, magnification, skew and directional scaling.

18. The computer program product of claim 17 further comprising instructions to cause a computer to calculate an affine transform from the plurality of points.

1 19. The computer program product of claim 18 further comprising instructions to cause
2 the computer to decompose the affine transform into a translation and a linear transform
3 matrix.

1 20. The computer program product of claim 19, wherein the extraction of magnification
2 comprises calculating the determinant of the linear transform matrix.

1 21. The computer program product of claim 19, wherein the extraction of rotation
2 comprises calculating an angle from the elements of the linear transform matrix.

1 22. The computer program product of claim 19, wherein the extraction of scaling
2 comprises calculating a pair of eigenvalues of the linear transform matrix, and wherein each
3 eigenvalue represents the amount of scaling in a direction represented by a corresponding
4 projection matrix.

1 23. The computer program product of claim 22 wherein rotation is removed from the
2 linear transform matrix prior to calculating the pair of eigenvalues.

1 24. The computer program product of claim 22 wherein skew is removed from the linear
2 transform matrix prior to calculating the pair of eigenvalues.

1 25. The computer program product of claim 16 wherein a user selects the at least one
2 component.

1 26. The computer program product of claim 25 wherein the user selects the at least one
2 component from a menu displayed on a user interface.

1 27 The computer program product of claim 16 wherein the area for the applying is
2 selected by a user, responsive to the movement of a virtual brush.

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1 28. The computer program product of claim 16 wherein the component is applied to an
2 entire image.

1 29. The computer program product of claim 16 wherein the component is applied to a
2 second image.

1 30. The computer program product of claim 16 wherein the second image is different
2 from the first image.

1 31. A computer program product having instructions stored in a computer readable
2 medium, containing instructions to cause a computer to:
3 display a first image on a canvas;
4 responsive to an input device controlled by a user, select an area of the first image;
5 responsive to a selection by the user from a menu, extract at least one component of a
6 distortion from the area;
7 responsive to movement and location of a cursor controlled by a user, apply the at
8 least one component to a second area of the first image.

1 32. The computer program product of claim 31 wherein the input device is a mouse.

1 33. The computer program product of claim 32 where the cursor comprises a virtual
2 paintbrush.

1 34. The computer program product of claim 31 wherein the at least one component of the
2 distortion is one of displacement, rotation, magnification, skew and directional scaling.

1 35. The computer program product of claim 31 further comprising instructions to cause a
2 computer to calculate an affine transform from the plurality of points.

1 36. The computer program product of claim 35 further comprising instructions to cause
2 the computer to decompose the affine transform into a translation and a linear transform
3 matrix.

1 37. The computer program product of claim 31 wherein the component is applied to an
2 entire image.

1 38. The computer program product of claim 31 wherein the component is applied to a
second image.

1 39. The computer program product of claim 31 wherein the second image is different
2 from the first image.